

Researchers create new synthetic heparin

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Researchers at the University of North Carolina at Chapel Hill have patented a synthetic version of the drug heparin, called Reomparin, that is less complex chemically and should be easier to produce than previous forms.

Led by Jian Liu, Ph.D., scientists in the UNC School of Pharmacy discovered that they could remove a complex element from the heparin molecule without altering the drug's function. The component, a single sugar called iduronic acid, is difficult to replicate and was long thought to be an important contributor to heparin's function as an anticoagulant, Liu said.

"We proved we don't really need that structure for the anticoagulant effect," Liu said. "By eliminating the iduronic acid unit, we were able to reduce the structural complexity of the heparin molecule by approximately 50 percent."

Their findings were published in the Sept. 24, 2007, issue of the journal *Chemistry & Biology*. The study was supported by a grant from the National Institutes of Health.

Heparin is most commonly used to prevent clots from forming and restricting the flow of blood during and after procedures such as kidney dialysis, heart-bypass surgery, stent implantation and knee and hip replacement. The annual worldwide sales of heparin are estimated at \$3 billion.

Heparin is a natural substance that is extracted from animal tissue, chiefly from cows and pigs. Outbreaks of diseases among livestock can interfere with production of the drug, driving up prices and tightening supplies.

“Synthesizing heparin, rather than extracting it from animals, gives us more control over its anticoagulant properties and creates a purer, safer, more reliable drug,” Liu said.

Currently, synthetic forms of heparin are difficult to produce in large quantities because of the drug’s complexity, resulting in expensive therapies that are not widely used, Liu said.

The simpler structure of Recomparin is likely to be easier to produce than other forms of synthetic heparin, Liu says. It is also expected to reduce dangerous side effects, such as uncontrolled bleeding, while providing the same benefits as naturally derived heparin.

The next step for Recomparin will be to find a company to license the drug and begin the process of getting Food and Drug Administration approval.

Source: University of North Carolina at Chapel Hill

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